

Research on the Application of IP Image Based on Digital Media Art in Enterprise Marketing

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Abstract: With higher visual expressiveness and interactivity, IP characters have been an important form of corporate marketing thanks to the rapid evolution of digital media technology. They have been an important part of brand communication, user engagement increase and market differentiation with digital media technology. Nevertheless, enterprise still faces challenges of homogenization of imagination, engineering realization difficulties, lack of user's emotional engagement in application. In this paper, based on discussing some technical elements of digital media art, the research contents the essential value of IP characters applied in marketing, and explored the essence of existing practice from the perspective of main contradiction, puts forward a specific optimization suggestions, hoping to provide enterprises with some theory basis and a series of practical guidance on developing IP characters applied in digital marketing.

Keywords: digital media art; IP image; enterprise marketing; brand communication

1. Introduction

In the process of a booming digital economy, the combination of digital media art and IP characters has been thought to be an important breakthrough in the digital transformation of companies. In February, 2023, five departments, including Ministry of Industry and Information Technology of China, launched jointly "Action Plan for Integrated Development of Virtual Reality and Industrial Applications" clearly call for the accelerated use of virtual reality, digital twin and other application of cultures and art to construct new digital content. Innovative creation of IP characters based on digital media art-based has got the policy orientation favor. As the new information technology like 5G, AI and XR rapidly develops, the digital media art transcends the limitation of classical expressive forms, making the IP characters own a higher communication value and vitality by interactive, dynamic and immersive experiences. Theoretical and practical significance of exploring the application of digital media art IP image in business marketing is important in this sense[1].

2. Digital Media Art Empowers the Core Value of IP Image in Marketing

The kinetic, experiential and sensuous nature of digital media art gives IP characters further vitality and expressivity. As an art form, digital media art released IP characters from the imprisoned image, making it possible for the character to have richer and more adjustable behaviors. Compared to the traditional static pictures, IP characters generated through technology can be freely applied to most marketing scenarios, like short clips, digital live-streaming and VR immersive interaction, greatly enriching user engagement and experience interactions.

The animation effects not only show the user's concentration, it also arouses a deeper understanding and appreciation on the stories and implication for the IP characters. Now, the fusion of digital media art with IP characters has become both technological and marketing a brand. Enterprises can fully play on the special advantages of digital media art to forge the IP characters with a strong and competitive advantage in a variety of situations. Such alignment maximizes the influence and reputation of brands in the market and opens up new business opportunities and potential values. The integration technical complexity — from real-time rendering to interactive design rules and immersive environment creation — establishes a new paradigm for a brand communication which is coherent with actual consumers' aspiration to interactive digital environments[2].

3. Second, digital media art IP image in the practice of enterprise marketing difficulties

3.1 Homogenization of creativity leads to lack of recognition of IP image

The phenomenon of stylistic convergence is a major problem in the IP design field. Most companies use similar designs mainly flat design, cute style, low-poly style, etc., which makes visual symbols in the market non-unique. Overuse of highly

saturated, light colors in the color palette generates a monotonous visual effect. The characters adopted a typical cute or cool prototype and are unable to generate brand identity. This homogenization is the work of pursuing market trends in brands without regard to any other concern.

More often than not, rather than recognizing their divergent cultural composition and differentiating strategies, we choose to follow successful market patterns, and killing creative and individual originality in design. Increased availability of design templates has only added to the problem. Underlying this quagmire is a conflict between commercial urgency and creative integrity, since designers typically produce IP characters as stitched-together constructions from a catalog of generic assets in service of a need to complete tasks efficiently rather than creatively; the results are usually neither captivating nor artful. While cost-saving, templatebased solutions are also less likely to produce derivative works that can either catch people's attention or build up strong brand equity. This reflects more general challenges to aligning creative expression with market demands in digital media art applications[3].

3.2 High technology implementation costs limit application popularity

The complicated technicalities in 3D modeling, skeletal rigging and the dynamic rendering — required for making digital media art-driven IP characters — need a large set of hardware and software resources. Another reason for the prevalence of these all too common mishaps seems to be the necessity of professional game engine support in order to generate state of the art real-time interactive designs together with necessary optimization work in order to gain a fluid cross-platform compatibility, which strongly pushes up development expenses.

However, owing to their funds limits, small and medium enterprises can hardly make up their technical teams or buy high performance render farms, resulting in huge amounts of IP characters which are obviously incomplete in terms of detail accuracy, animation fluidity and interactive experience. Additional complexities of the implementation project involve technical challenges including data security, user privacy preservation and platform compatibility. All out-sourcing effort has limited impact because the outsourced teams is seldom aware of what the company brand really is, and cannot always adapt IP characters and tone of brand together, which convert technical investment into marketing value may be failed.

4. Optimization Strategy of Digital Media Art IP Image in Enterprise Marketing

4.1 Deconstructing Brand Culture Gene and Reshaping Different IP Image

Digital era of art needs to analyze, decompose and reshape the brand cultural genes in order to establish own IP characters. Using semiotics analysis, brand tale telling theory to turn vague brand value into clear brand pictures and iconic symbol system that recognizable by consumers. The first step is digitizing the brand historical archives and then, exploiting natural language processing, extracting the most relevant cultural elements: the second step consist in designing their visual representation trough design thinking workshops. It is important that 3D character modeling can not be achieved without digital sculpting tools, such as ZBrush, together with texture authoring tools, e.g. Substance Painter, to obtain a detailed, and an expressive surface materiality in high precision[4].

Motion capture gets over such a limitation of traditional animation through optical tracking or inertial tracking devices, as they capture the live body performances of professional actors, adding real-looking acting and micro-movements to IP characters. In addition to enabling cinematic lighting in real-time, Unreal Engine's Blueprint visual scripting engine also enables the non-technical to be involved in the creation of the interaction logic. Dynamic narrative, which is not necessarily linear, offer tools such as Twine for non-sequential narrative and learn and refine story sequences through user experience. By incorporating the affective computing technology into the process, user feedback can be quantitatively evaluated by means of facial recognition and physiological signals monitoring to further adjust the personality of IP characters continuously.

4.2 Integrating AI Big Data Technology to Optimize Personalized Interactive Experience

Due to the radical evolution of artificial intelligence technology, it brings new opportunities for IP character intelligent augmentation in visual generation. There are variants of generative adversarial network (GANs) like StyleGAN that can provide unbreakable parametric control over appearance of IP character generation that users can achieve customised variations with a simple slide of a slider. Dynamic Autoencoders. Dynamic (variable) autoencoders leverage the advantage of learning feature distributions in the latent space and can generatively generate IP character representations via user profile information. Imitative personality design — Given that behavioral decision algorithms like Deep Q-Networks(DQN) and Proximal Policy Optimization(PPO) can simulate tens of millions of interaction scenarios within reinforcement learning, the IP characters are able to exhibit more lively personalities and adaptive behaviors.

The contextual understanding dialogue systems are composed of the Transformer architectures(e.g., GPT series)

coupled with speech synthesis technologies like WaveNet in natural language processing. Knowledge graphs incorporate brand-related knowledge, which will ensure that the dialogue is conversational and brand consistent. The application of computer vision helps have more immersive interactive experience—OpenCV and deep learning based facial landmark recognition accurately detect users' micro expression; emotion recognition model converts user's visual micro-expression to emotional vector signal and drives real-time corresponding responses from IP character. The real-time user behavior analytics system applied Apache Flink and Elasticsearch stream processing frameworks to achieve millisecond-speed data retrieval so that personalized recommendation could be done at data processing level with decision support. Together, these organic technologies, create an individual digital journey that is also closed-loop where each consumer enjoys personalised IP interactivity resulting in a vast boost in retention and brand awareness.

4.3 Reconstructing the Cost Structure of Technology and Realizing the Implementation of Inclusive Application

With the advent of cloud-native tech stack, technical democratization solutions could be achieved for small and medium-sized enterprises (SMEs). Kubernetes container orchestration at the infrastructure layer eases the computing resource's elastic scheduling; and service mesh architecture ensures reliable microservice communication. WebAssembly-powered web apps, which are web software-as-a-service (SaaS) apps, help advanced 3D modeling apps run directly in browsers, so that they do not require much hardware. ²¹ Using WebAssembly-based modeling engines, parametric design platforms powered by node-based modeling languages allow untrained users to easily make an array of changes in variations of IP characters using easily adjustable parameters. The technology that implements adaptive bitrate is applied in the distributed cloud rendering system that helps rendering output adapt on different device rendering performances, meanwhile the edge computing nodes effectively reduce the connection delay time. Modular design process leads to a component-based system architecture where new system functionalities could be deployed in a hot-swapping way via the function interface definitions.

Standardization Simplifies Third-Party Integrations While RESTful-compliant open APIs lowered the barrier to implement third-party integrations, further documentation and toolkits for developers are necessary to decrease the barrier of implementing thirdparty integrations as much as possible. The recent development in AIGC has revolutionized the cost-effectiveness — ControlNet plug-in so that Stable Diffusion models can capture the accurate image, and the Neural Radiance Fields (NeRF) technology to synthesize highquality 3D model from multi-view pictures. Monitoring: Prometheus based monitoring system for real time observation of the performance data, Grafana based visualization dashboard for a graphical view of performance data, ELK stack for fast troubleshooting. The overall solution presented here empowers SMEs to make available, with manage able prices, a professional IP digital character solution ensuring system scalability and evolution possibility - technology enabling effect.

5. Conclusion

Digital Media Art has created brand communication avenues for unprecedented potentials of IP characters in corporate marketing. However, companies will have still to overcome hurdles of homogenization of creative works, technical challenges, and lack of user interaction. Specifically, through the exploration of brand culture, integrating AI and big data, forming matrixes in a cross media space and optimizing costs, companies can manufacture more competitive IP characters to realize the brand value maximization. With the vision of metaverse and AIGC technology, IP characters for which digital media art plays an increasingly crucial role will take a larger space in companies' marketing strategies. Organizations should also make themselves aware of technology updates and try to further put IP marketing strategies into place to align with constantly changing market demands. This innovative approach will ensure that brands remain at the frontline of engaging customers fully immersed in the digital world.

References

- [1] Gan X. Research on the Application and Development of Digital Media Art in Urban Public Space Design[J].Journal of World Architecture, 2024, 8(2):62-66.
- [2] Liu Y. RETRACTED: Research on the development trend and application of digital media art in graphic design education[J].International Journal of Electrical Engineering Education, 2023, 60.
- [3] Guo Chunfeng, Zhang Xi, Gao Zhengjie. Application of Virtual Reality Technology Based on Convolutional Neural Network in Digital Media Art Creation[J].International Journal of Cognitive Informatics and Natural Intelligence (IJCINI), 2024.

- [4] Liu Y, Fan C S, Liu P X. Research on Digital Media Intelligent Art Creation Based on the Fusion of Virtual Reality and Semantic Features[J].Journal of Information Science & Engineering, 2023, 39(1).

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